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ABSTRACT

The objectives of this study were to assist the Kansas City School District in the formulation of policy on the consolidation and closing of schools, development of objective criteria to aid decision-making on these issues, and specification of procedures for the implementing of such policy and policy decisions. The decision model developed had ten criteria ranked in order of importance--achievement levels in the schools, facility cost per pupil, space per pupil, teacher load, racial or minority balance, age and general condition of the buildings, auxiliary facilities, commuting distance, number of pupils, and fuel requirements. The model was formulated as an additive function of the deviations from standard on each of the criteria, adjusted by the weighting algorithm to yield a single, composite "Index for Retention." The model and the ranking for all elementary schools are contained in the appendixes. The proposed board of education policy statement and a policy for implementation are also included. (Author/IRT)

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Dr. A. O. Thurman

MIDWEST RESEARCH INSTITUTE

ED140466

MRI REPORT

DECISION CRITERIA AND POLICY FOR SCHOOL CONSOLIDATION

U S DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

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FINAL REPORT
March 15, 1974

MRI Project RA-115-D(1)

For

Kansas City School District
1211 McGee
Kansas City, Missouri

Attn: Dr. Robert Medcalf, Superintendent

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EA 009 632

FOREWORD

The epitome of stability, U.S. public education has long gone about its job of teaching and acculturation of the young in traditional and time hallowed ways. This era of stability ended after the second World War.

Since that time, one problem has piled on another to challenge the wisdom of a Solomon and the patience of a Job. The rapid growth of American cities following World War II required giant facility expansion programs. These programs were beginning to catch up to the needs of new pupils when the landmark 1954 Supreme Court decision was handed down. The Court-ordered desegregation of schools undoubtedly contributed to the trickling reverse exodus--to the suburbs. The trickle became a torrent and the central portions of most American cities began a slow but seemingly inexorable deterioration.

Teachers, long a dedicated and respected though underpaid class of American society, rejected their continued relegation to second class economic citizenship and placed new demands on an already beseiged school treasury.

Failure fed upon failure. The fleeing taxpayers left behind a constituency that began a litany of revolt. Levy after levy, bond issue after bond issue was tried and failed.

The above characterization could be written about many major metropolitan areas of the U.S. Unfortunately, it is also written about the Kansas City School District.

The decline of the central city and the diminishing school age population has brought the problem of physical plant utilization to a sharp focus. Declining enrollments at some schools, coupled with extremely tight budgets, make it mandatory to examine the efficient utilization of school facilities in order that limited resources be allocated for the optimum good. This issue, then, policy and decision criteria for addressing school consolidation, is the subject of this report.

Dr. Robert Medcalf, Superintendent of the Kansas City School District; Mr. Robert Gaynor, Vice President and General Manager of AT&T Long Lines; Mr. Don Smith, Vice President and General Manager, Southwestern Bell; Dr. Charles Kimball, President, and Mr. John McKelvey, Executive Vice President of Midwest Research Institute, laid the foundations for this study in January 1974.

We are deeply grateful for the help of many people in this study. Mr. Gaynor volunteered some staff assistance. We deeply appreciate the help Miss Barbara Nickel of AT&T provided in the extensive analytic tasks.

We interviewed all members of the School Board and are deeply grateful to Mrs. Robbie Tyler, President, and all other Board Members for giving several hours of their valuable time.

Key administrators also contributed their time and efforts in helping us understand the background of the issue as well as providing the voluminous data we requested. Mr. Travis provided us with his files of correspondence with other school districts on the consolidation issue and the benefits of his long and valued experience with the District. Mr. Newell provided data on school facilities as well as results of some earlier, similar studies in the District. Mr. Baker discussed budgetary aspects and costs with us, furnishing us with required cost data. Dr. Mary Meehan gave us very valuable insight into the achievement testing functions of the District. This was particularly appropriate since there is consensus that--of all the factors bearing on consolidation--academic achievement is the most important.

Mr. Richard L. Salmon, Manager of Health and Education Programs, was the principal investigator. Miss Mary Cleveland, Research Assistant, did the quantitative analysis and made other major contributions to the study.

MIDWEST RESEARCH INSTITUTE

Gary R. Nuss, Director
Economics and Management Science Division

March 15, 1974

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I. INTRODUCTION--THE PROBLEM

School patrons, voters, political groups and the public in general are concerned that the total resources available to public education are optimally allocated among the varying claimants within the school system--teachers' salaries, special education, programs for the disadvantaged, equipment, operation and maintenance of physical plant, etc. They are concerned but the Board of Education and the school administration are responsible. This is a fundamental responsibility and has always been so. In the Kansas City School District--as in nearly all U.S. metropolitan school districts--this responsibility has become more critical and difficult in recent years.

The source of the difficulty is quite clear--finances. Figures 1 and 2 illustrate the financial squeeze. About 55 percent of operating receipts are derived from property taxes which are insensitive to inflation. On the other hand, nearly two-thirds of operating expense is for salaries--mainly teachers. Salaries are extremely sensitive to inflation. Table 1 illustrates how the failure of levies has effectively put a lid on property taxes. The financial squeeze then is between a fixed property tax ceiling and a rising salary floor.

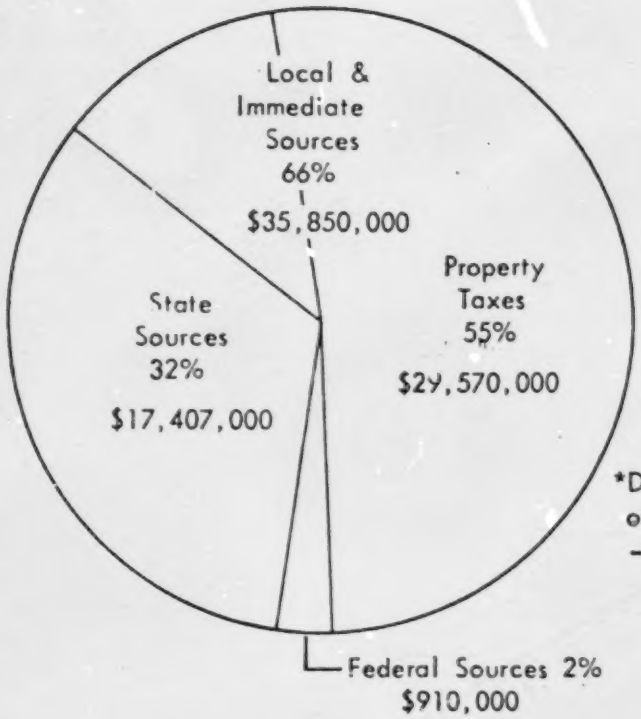
TABLE 1

KCSD SCHOOL ELECTION RESULTS (1967-1972)
SCHOOL OPERATING LEVY ELECTIONS

Date	Election	Total Levy	Total Vote	Percent For	Result
1-24-67	Special	3.32	38,674	60.4	Passed
4-1-69	Special	4.70	39,736	45.3	Failed
5-20-69	Special	4.30	54,281	53.3	Failed
7-1-69	Special	3.75[a/]	44,933	62.9	Passed
7-23-70	Special	4.71	24,523	52.6	Failed
5-18-71	Special	4.65	34,327	53.8	Failed
8-10-71	Special	4.40	33,708	52.0	Failed
12-7-71	Special	4.29	38,249	46.5	Failed
8-8-72	Primary	0.15	36,866	48.5	Failed

a/ Law changed to allow previously approved levy to continue at the same level without voter approval.

KANSAS CITY, MISSOURI SCHOOL DISTRICT
OPERATING RECEIPTS

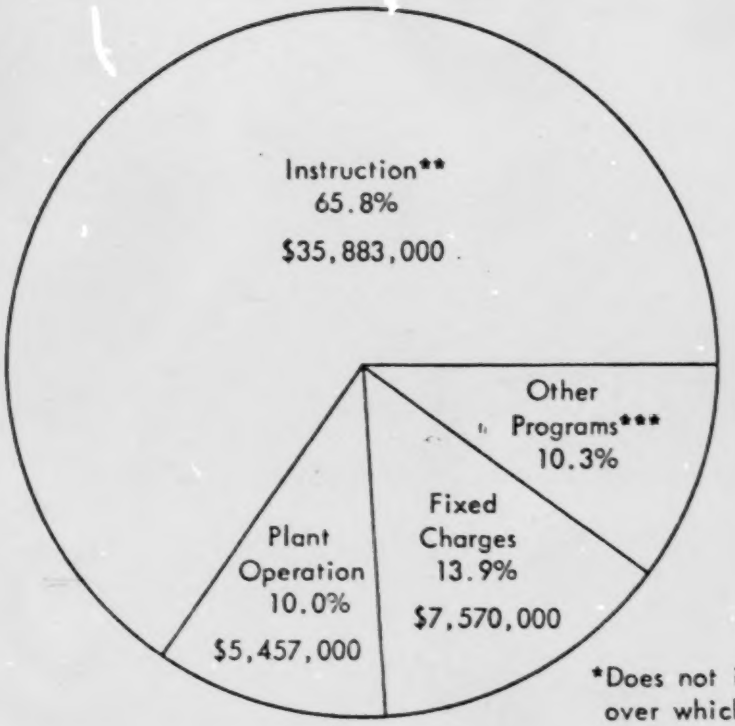


TOTAL BUDGETED RECEIPTS*
$54,167,000

*Does not include certain categorical programs over which the KCSD has little control - - - $15,748,000.

Figure 1

KANSAS CITY, MISSOURI SCHOOL DISTRICT
ESTIMATED OPERATING EXPENDITURES



TOTAL BUDGET*
$54,559,000

*Does not include certain categorical programs over which the KCSD has little control.

**Primarily teachers' salaries, but also includes such items as Principals, clerks and school supplies.

***Includes such things as Administration and Plant maintenance.

Figure 2

Despite these problems, teachers' salaries in the KCSD are still competitive--locally and nationally.

KCSD TEACHERS (1973-74)

Total number of teachers	2,832
Average salary	$10,700

KCSD teachers' salaries average lower than New York, Chicago, Los Angeles, or Denver. They are comparable to Dallas, New Orleans, and the other Kansas City area districts.

KCSD per pupil expenditures are also competitive. The following chart compares the KCSD with the Shawnee Mission District--a good local standard--and the nation generally.

TOTAL EXPENDITURES PER PUPIL (1972-73)

KCSD	$1,062
Shawnee Mission	1,049
National Average	1,016

The expenditure per pupil should be placed in context. It may be assumed (erroneously) that since the expenditures per pupil are about the same as in the average U.S. school district--that this is about the right amount to spend. This might be true if the Kansas City School District were really "average." Unfortunately, problems with which KCSD must cope are not at all average. For example, special education programs--all much more costly than conventional educational programs--enrolled 7,246 pupils in the 1971-1972 school year. This represented a surprising 11.2 percent of the total school census. These programs address especially academically talented, expectant school age mothers, orthopedically handicapped, the severely neurologically impaired children and others.

There is also need for increasingly expensive vocational and technical training for those who are not qualified or do not intend to seek college training. These needs are being met with expanding Voc-Tech programs--but at a cost.

The physical plant of the Kansas City School District--the school buildings--are ancient. Repairs and remodeling are increasingly expensive and a comprehensive remodeling project to raise them to high standards for academic use would be prohibitively expensive.

School Consolidation

Over 60 percent of the 100-odd schools in the Kansas City School District were built in the 1930's or before. Despite some remodeling in recent years, a good number of them should be replaced. Many are simply obsolete to the point that the plumbing is useless and the electrical system is incapable of handling a TV set or a window air conditioner. The average age of school facilities in the KCSD is 47 years. Figure 3 shows the building age breakdown. One of these schools--Booker T. Washington--was built in 1888!*

In the face of declining District enrollments, antiquated physical plant and severe restraints on budget--it would be derelict on the part of the Administration if serious consideration were not given to school consolidation.

Unfortunately, there are no generally accepted policies for such action in the Kansas City School District.

The available history of consolidation and consolidation attempts goes back to 1942. In that year Adams, Allen, Graceland, Jefferson, Penn, Wheatley and White were proposed for closing. The patrons of Adams and Allen protested and these schools were not closed at that time.

Although there have been a number of schools closed in the years since then, the precedent of the withdrawal in the face of patron protest has not served well. Given that the decisions were well founded in the first place--this withdrawal indicates a lack of firm policy. It is, of course, a major objective of this study to assist in the formulation of such policy.

In formulating such policy and associated decision criteria, we are fortunate in that the consolidation issue is not unique to Kansas City. It has been faced by other metropolitan districts and their experience can be helpful here. We cite these experiences in later sections.

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* By contrast, the average school in the Shawnee Mission District was built in 1958.

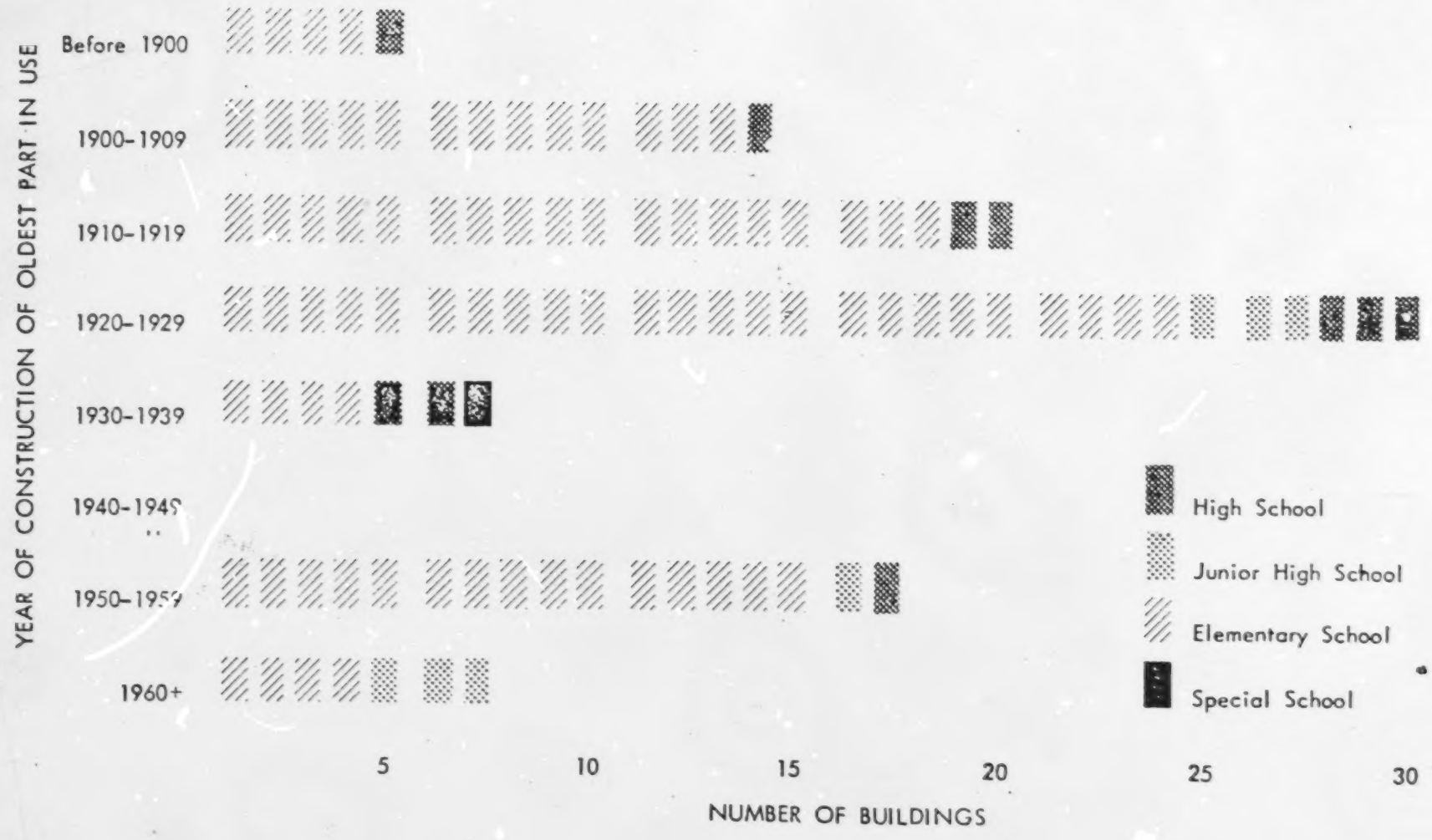
100 SCHOOLS - AVERAGE AGE 47 YEARS
YEAR OF CONSTRUCTION OF OLDEST PART IN USE
Before 1900
1900-1909
1910-1919
1920-1929
1930-1939
1940-1949
1950-1959
1960+
5
10
15
20
25
30
NUMBER OF BUILDINGS
High School
Junior High School
Elementary School
Special School

Figure 3

II. OBJECTIVES AND METHODOLOGY

The objectives of this study were to assist the Kansas City School District (KCSD) in the:

* formulation of policy on the consolidation and closing of schools;

* development of objective criteria to aid decision making on these issues; and

* specification of procedures for the implementing of such policy and policy decisions.

To achieve these objectives, a 6-week work plan was developed and executed. In these 6 weeks we:

* performed a comprehensive literature search--we cite appropriate research studies under References below;

* reviewed--by correspondence and telephone--the experiences of 11 other U.S. school districts that had had recent similar experience. These ranged from Montgomery County, Maryland, to Hayward, California;

* interviewed key KCSD administrators;

* reviewed the extensive and comprehensive study of the KCSD done in MRI's Civic Council Study of 1973;

* interviewed all current members of the KCSD School Board;

* assembled 10 objective criteria (based on all the above) for a ranking of all KCSD elementary schools. This ranking is a relative measure of the contribution of each school facility to the overall school system effectiveness;

* formulated a model policy statement; and

* developed and specified procedures for implementing consolidation policy.

The collective judgment of Board Members was used to formulate a decision model for facility ranking. The decision model is based on 10 objective criteria. The judgments of the members of the Board yielded the following criteria--listed in order of adjudged importance:

1. Achievement levels
2. Facility cost per pupil
3. Space per pupil
4. Teacher load
5. Racial or minority balance
6. Age and general condition of the buildings
7. Auxiliary facilities (gym, library, etc.)
8. Commuting distance
9. Number of pupils
10. Fuel requirements

The decision model was formulated as an additive function of the deviations from standard on each of the criteria, adjusted by the weighting algorithm to yield a single, composite "Index for Retention." The Index for Retention was used to rank all elementary schools in order of the feasibility of retention. This ranking is contained in the appendix.

The interviews were also very important in developing the recommendations for the specifics of policy as well as the procedures and strategy of policy implementation.

Since this report contains a list of all Kansas City School District elementary schools and these schools are very explicitly ranked--we should be very clear as to what this ranking does not mean. It is not a measure of the effectiveness of teachers, nor the efficiency of the school principals, nor the worth of academic programs and curricula. In general, it is not an evaluation of people or programs, per se.

It is a measure of the efficient use, relative effectiveness and contribution of that specific physical plant to the school system as a whole. Closing the school ranked at the top of the list would have the worst total effect. The school on the bottom would have the least total effect.

Finally, we should also point out two things. No one factor dominates this ranking. Ranking is a function of a combination of factors suitably weighted by the judgments of knowledgeable people. Secondly, because of the inherent measurement and prediction error in the data used and because of the imprecision of even the best of human judgment--we should not slavishly insist that the school ranked number one should not be number two nor that the school ranked 70th should not be 69th. We would estimate the precision of ranking to be $\pm$ 2 ranks.

III. CONCLUSIONS AND RECOMMENDATIONS

On this issue, as on any other important issue, it is impossible to segregate consolidation from the total fabric of school administration. In order to view the issue in context--to see the "Gestalt"--and seek a satisfactory system solution, such separation is undesirable. Thus, the conclusions below range beyond consolidation and form a structure of opportunities and constraints within which consolidation must be addressed. We should also point out that some input to these observations and conclusions came from the earlier MRI study cited above.

A. Lack of Confidence and Suspicion

Many years of failure to solve academic and administrative problems of the Kansas City School District have eroded public confidence in the administration, the Board, the teachers, and the school system in general. Divisiveness of past Boards, and their tendency to meddle in trivial administrative detail, the lack of strong leadership, the long "lame duck" period of the last superintendent, the integration suits and the arising labor problems (teachers' unions), combined simultaneously to virtually overwhelm the capability of the District to cope. During the time when the District was being particularly beseiged by the integration suits--1972-73--some teachers and administrators went into a state of caution that bordered on catatonic. Creativity and innovation do not flow from beleaguered educators.

Initiatives of the administration were often viewed with suspicion. Mrs. Donald Carter, a patron of the Martin School, which was recently proposed for closing, wrote a letter to the Kansas City Star. She said, in part: "On January 28, the seventh grade class of Martin School was transferred to Northeast Junior High...did the administration make the transfer at this time to benefit the students, as claimed, or to influence the MRI report?" There have been allegations that the closing of Martin School and other schools in areas of high land values have been influenced mostly by the value of the land and little by the impact on the pupils affected. Thus, the common American proclivity to suspect conspiracies prevails.

It is our opinion that if these people understood the organization and operation of the KCSD central administration--which, for the most part, they do not--they would understand that the central administration lacks the organizational cohesiveness to mount a conspiracy even if they wanted to.

B. The "Window" for Action

In NASA's space program, scientists often speak of a "window for launching"--meaning a short time period when the relative positions of the Earth, moon and other astral bodies are just right for the mission. Such a condition now exists in the Kansas City School District. We discuss the evidence below. The important thing is that the "window" opens and it closes. It will close in another 6 to 9 months.

C. Lack of Comprehensive, Integrated Planning

Although there have been a number of more or less comprehensive plans assembled in the past--the Havighurst Plan, the Cluster Plan, et al.--there has been no continuing effort to integrate all administrative functions and guide them toward common and nonconflicting goals. As a result, consolidation issues are divorced from other, more positive activities planned in the district. Viewed in isolation, these actions seem to be regressive and unremunerative. "Where is the 'quid pro quo'?" "What do we get out of the money you save?" "Looks like you've given up--when do you plan to shut the whole school system down?" "Is there some benefit to come out of this closing or will the money just go down the rat hole down there at the Board of Education?" These are the questions patrons are asking.

Most school patrons are rational. They will accept some sacrifice if it is clear that it is necessary and that someone will benefit by it. The question must be answered: "What are these benefits and what confidence can we have that we shall not continue this downward spiral?"

D. Reasons for Optimism

The negative conditions noted above derive mainly from many years of neglect, inaction and ill-advised action. The current Board and administration are not yet tainted by these past failures. There is reason for optimism.

Following the MRI study for the Civic Council last summer--there has been a growing concern and a willingness to act on the part of area business leaders. These leaders agreed to the conclusion of that study that public education (read "the Kansas City School District") is the number one problem for civic attention. They recognized that even in their own interests, the problem must be dealt with if Kansas City is really to be "One of the few liveable cities left." These concerns have been manifested in action. For example, the "Loaned Executive" program has assisted the District administration. This study is being partially supported by the American Telephone and Telegraph Company.

The majority of the Board of Education are new. They do not know that "the problems are impossible of solution" nor would they subscribe to such a notion. They appear to be willing and able to find common ground between the need to represent their constituents and the need to unify on common goals.

On the issue of consolidation and the factors that should be considered in consolidation decisions, there was significant general agreement.

Although the integration issue is still alive and must be dealt with--there is gratifying evidence that tempers are cooling, and that confrontation as a political device is losing its appeal. There is evidence that "the message has been sent and received loud and clear"--that the time for rhetoric is past and the time for action is here. Board members, black and white, are conciliatory on the integration goal and view it as not exactly the same--and not to be confused with the goal of quality education.

The general public as represented by school patrons is ready and optimistic about change. The recent drive by the 49-63 Association demonstrated concern, optimism and willingness to accept leadership. Members collected signatures attesting confidence in the administration. The signatures were on a pillow with a one-way sign on it signifying that "there is only one way we can go now--up."

The paralyzing sense of caution on the part of administrators and resulting hesitancy to act, seems greatly dissipated since our Civic Council study of a year ago. There are some signs of impatience but also of expectancy. All realize that an opportunity exists now that has not existed for years and may not exist again for a long time.

E. Recommendations

To address the consolidation issue within this environment, we would recommend three actions:

1. Develop an integrated and comprehensive plan. This plan would include consolidation, construction, remodeling and all other school facilities activities. Most important, it would include academic, personnel, operational and administrative programs to improve the achievement level of all pupils and allocate resources to do this at minimum cost. It should answer the question of "quid pro quo." It should include plans for an increase in the levy. Realistic, achievable and concrete objectives should be specified, e.g., the standards presented in Mrs. Kempton's "Educational Needs for Children," January 9, 1974. It should include reorganization of the central administration. The reorganization should include provision

for an administrative function to continuously administer the comprehensive plan--an "Office for Institutional Research and Planning." The plan should be completed and announced not later than fall 1974.

2. Adopt a policy and associated administrative procedures for the closing of schools. A model policy statement is presented in a following section. Some version of this should be adopted and become standard guidance for future consolidation decisions. The effect of adopted policy will lessen future controversy and allegations of discrimination. Possibly just as important are the suggested procedures for implementing policy--automatic annual review, patron participation, development of alternatives, etc. These items are discussed more fully below.

3. Use objective criteria to support decisions on consolidation. The decision model presented below will provide several advantages:

* By incorporating consideration of all objective factors of importance to the decision--isolated, salient factors are not selected as the sole basis of decision.

* Much of the decision basis can be on verifiable fact.

* Attention is focused on factual evidence rather than emotional appeal.

* It is relatively insensitive to changes in one or two factors.

We would recommend that this or a similar formulation be adopted by the Board as an official measure of the feasibility for retention of each school. We would recommend that the administration prepare updated school listings on an annual basis with recommendations for Board actions.

F. Model Policy Statement

As this study was nearing completion, and this report was being written--we received the report of a similar study performed by a "Small Schools Task Force" of the Montgomery County Public Schools, Rockville, Maryland. Mr. George W. Fisher, Director of Planning for that countywide school system, graciously furnished this information to Mr. Travis, Deputy to the Superintendent of the Kansas City School District.

The Small Schools Task Force was composed of 23 people who worked on the consolidation problem for about 8 months--March through November 1973. The work is very good. It and that of Hayward, California, are the best we

have seen. Their problem was so similar and their results so appropriate to the Kansas City situation, we have adapted their proposed policy statement.

PROPOSED BOARD OF EDUCATION POLICY ON SCHOOL CONSOLIDATION

WHEREAS, Elementary school enrollment has been declining at several attendance centers in the Kansas City School District, and this trend is expected to continue in the coming years, and

WHEREAS, Small schools do not seem to offer educational advantages when compared to medium or large schools, and

WHEREAS, The cost of operating and modernizing elementary schools with small enrollments is significantly more per pupil than in larger schools, and

WHEREAS, There is a continuing need to utilize available resources effectively, and

WHEREAS, Substantial savings in operating costs could be realized by consolidating small schools or by sharing services among small schools, and

WHEREAS, Capital budget savings can be realized by eliminating modernization projects in small schools whose enrollments can be transferred to neighboring schools with available space, and

WHEREAS, It is recognized that a community will evidence concern when faced with the possibility of a school consolidation; now therefore be it

Resolved, That it is mandatory that all small schools be reviewed annually utilizing the criterion and factors established in the 1974 MRI Consolidation Study in order to determine their future use; and be it further

Resolved, That major modernization not be recommended for a small school until a careful review of alternatives has been carried out and its future determined; and be it further

Resolved, That the community advisory/decision-making process and timetable recommended in the 1974 MRI Consolidation Report be followed in considering the future of each small school.

IV. POLICY IMPLEMENTATION

Community involvement--the lack of which has precipitated much criticism of the KCSD school administration--is the one major addition to current practices in consolidations. We would recommend a chronology of activities to include community involvement in the following manner.

A. Administrative Action

In the late fall of each year, the administration will prepare an updated listing of schools, ranked by the recommended criteria. Associated operating details and qualitative factors will be developed on those ranking in the bottom 10 to 20. This report will be presented to the Board in January.

B. Board Action

The Board of Education will approve the report and establish a Local Evaluation Committee for each school or school cluster area. The committee will include representation from the administration and the community. Recommendations on the membership of such committees might come from local principals, PTA leaders, civic association leaders, and others. Committees should be appointed in January. Committees are one-time task forces but might continue in operation through implementation of final actions.

C. Local Evaluation Committee Action

The main objective of this committee is to provide a local evaluation report. The report should be on a timely basis--4 to 6 weeks--and should:

* Suggest alternatives that are reasonable and achievable.
* Assess impact of each alternative on quality of education.
* Analyze factors which bear on alternatives.
* Identify other uses for school facilities.
* State probable community reaction to each alternative.
* Indicate committee preferences but indicate significant dissenting views.

The administration representative should operate as liaison for the committee in assembling any required information or data from central administration files.

The local evaluation report should be rendered by the first of March.

D. Final Action of the Board

The Board would receive the report, administration comments and such additional information as is deemed desirable by April. Hearings, if required, would be scheduled for April and May and a decision would be made in May or June to become effective in the beginning of the following academic year, i.e., the next following September. These decisions could be any of the following:

* Close the school.

* Reduce operating costs by sharing staff or services with a neighboring school.

* Expand the school by moving children in from adjacent schools.

* Convert the school to other academic use, e.g., model school.

* Do nothing.

APPENDIX

THE DECISION MODEL

A. General

What is usually meant by the term "decision model" is an analytical formulation for aiding decisions. That is how we use the term. Such decision aids have become an increasingly useful tool to assist policy makers in balancing off mutually incommensurable values. There are two very important reasons for this.

First, there is need to carefully separate quantifiable and demonstrable facts from judgment, prognostication, guess and pure speculation. Facts provide a critical portion of the decision basis--not all the basis, but an important portion. They can provide a focus point for generating agreement and consensus. The arraying and manipulation of these facts under thoughtful, rational and logical rules result in information useful to the decisions at hand. The logical rules for extracting information from data form an analytical model.

A second reason for using a model is the requirement for combining and weighing judgments on many factors simultaneously. People have no difficulty rendering judgment on one factor. Further, when such judgments are obtained from knowledgeable people, they tend to be good. They are even better when combined with similar judgments from other people. This is the philosophy underlying the forming of boards, advisory councils, elders, etc.

Unfortunately, when a composite judgment must be made which involves many factors of varying importance and severity--even the best minds do not integrate well and must be aided by an analytical framework. This framework is the decision model.

B. The Criteria

The 10 criteria forming the basis of the decision model were derived from correspondence with other metropolitan school districts; Kansas City School District publications--Recommendations on School Closings/Combinations and Educational Needs for Children; and discussions with the individual School Board members and the research literature.

A list of these criteria is contained in Table 2. The derivation of the ranks and weight will be discussed in the technical description following.

TABLE 2

FACTORS, RANKS AND WEIGHTS

Rank	Factor	Weight
1	Achievement Levels	9.862
2	Cost Per Pupil	9.597
3	Space Per Pupil	8.324
4	Teacher Load	6.915
5	Racial Balance	6.000
6	Age and General Condition of Building	5.000
7	Auxiliary Facilities	3.206
8	Commuting Distance	2.104
9	Number of Pupils	1.388
10	Fuel Requirements	0.142

Achievement levels are considered for the school in question as well as surrounding schools. To transfer pupils to a lower achieving school would, in part, defeat academic purposes. Thus, we say that if an administrative action does the pupil no good--it should at least do him no harm. If surrounding schools have a lower achievement level the "achievement" factor would contribute to the feasibility of retaining the school.

The cost per pupil for each individual school was considered in relation to the average cost per pupil for the district. A cost per pupil lower than the district average would increase feasibility of retention.

The space per pupil was defined as being the total square feet of the the school plant divided by the total current enrollment, including special education students. Space per pupil for each school was compared to the district average (111.087 square feet).* Space per student less than 100 square feet indicated overcrowding, while space per student greater than 120 square feet indicated inefficient utilization of the school plant. Thus, variations below 100 square feet or above 120 square feet were considered unfavorable to retention.

The teacher load was considered to be commensurate with the pupil/teacher ratio and the number of combined classrooms. A favorable pupil/teacher ratio, as indicated by district standards, would be 25 to 30 pupils per teacher.

* This figure is comparable to the results of a survey conducted by the Educational Facilities Laboratory, New York, of schools built during the period 1956-1958. This survey found the space per pupil for the North Central region of the U.S. to be 117 square feet.

A ratio below 25 would indicate inefficient utilization and a ratio above 30 would be considered an overload. All combined classrooms, more than one grade per teacher, violate the district standard of one teacher per grade. Deviations reduce the feasibility of retention.

The racial balance was considered somewhat like the achievement levels. If a school were to be closed and the students transferred, what effect would this have on the racial balance of the receiving school? A transfer of students which resulted in the racial balance of the receiving school approaching the overall district racial balance was considered favorable. If the transfer resulted in the racial balance of the receiving school moving further from the overall district racial balance, it was considered unfavorable.

The age of a school plant has been found to be highly correlated with expenditures for remodeling and repairs. Thus, the ages of the individual school plants were compared to the District average. Those whose ages were less than the average were considered to need fewer repairs and remodeling, while those whose ages were greater than the average were considered to need more repairs and remodeling. Thus, old schools are less feasible for retention, other things being equal.

The individual schools were rated as to whether of not they had the following auxiliary facilities: cafeteria, health, library or resource center, and auditorium. Lack of any of these facilities was considered unfavorable.

Any additional commuting distance was considered unfavorable. The additional commuting distance for purposes of this model was the distance to the nearest receiving school.

The number of pupils refers to the average enrollment for the next 5 years. All school closings are unfavorable from the vantage point of the students transferred. Thus, the greater the number of students involved, the more feasible is retention.

Fuel requirements of the individual schools were considered to be of minimum importance in deciding upon school closings/combinations. Therefore, they have been eliminated as a criterion in this decision model. However, in view of the current "energy crisis," fuel shortages may well play a qualitative role in decisions involving school closings and combinations.

C. Other Qualitative Factors

There are several nonquantitative factors, which, by their nature, are unable to be expressed in the decision model. They should, nevertheless, be considered in school facility decisions. They are:

1. Community impact: The very nature of its function often causes the neighborhood school to be a focus of community affairs.

2. Psychological and cultural impact on affected students: Very often the transfer of a cultural or ethnic group of students to a culturally different environment can have a very debilitating effect on their learning abilities.

3. Safety and security: Although a transfer may involve only a few blocks additional walk to school--a new safety hazard may be introduced, an intersection with heavy traffic, a railroad track, etc.

4. Ability to relate to physical environment: An elementary school pupil undergoes a phased, gradual expansion of his world of learning. First his nursery, then his home and yard, then his block and neighborhood school. He can relate to this and has familiar physical and psychological landmarks. If he is transported for several miles to be among strangers, the tempo of this unfolding world is broken.

We do not believe the presence or potential of any of these factors should be decisive. They can all be ameliorated by operational and academic actions and provisions. They are considerations, however, that must be weighed against the quantitative indicators and against the dictates of limited financial resources.

D. Technical Description

The decision model is multidimensional scaled, nonmetric and is formulated as follows:

Index of Retention:

$$9.862\ (Ach_S - Ach_R) + 9.597\ (100 - {}^{C/P_S}/_{C/P_D}) - 8.324\ (\Delta\ S/P_S)$$

$$- 6.915\ (\Delta\ TL_S) + 6\ (\Delta\ Min_{R+S} - \Delta\ Min_R)$$

$$+ 5\ (Age_D - Age_S) - 3.206\ (25\ \#\ facilities\ lacking_S)$$

$$- 2.104\ (\Delta\ CD) - 1.388\ (\#\ pupils)$$

where,

(Ach_S - Ach_R) is the achievement index of the sending school minus the achievement index of the receiving school

(100 - $C/P_S/C/P_D$) is the percent deviation from the District's average cost per pupil, C/P_D, of the sending school's cost per pupil C/P_S. $C/P_S/C/P_D$ is expressed in a percent.

(Δ S/P_S) is the percentage deviation either above or below the 100-120 square feet per pupil.

(Δ TL_S) is the percentage deviation either above or below the standard teacher/pupil ratio of 25-30 plus the percentage of combined classrooms in the sending school.

(Δ Min_{R+S} - Δ Min_R) is the absolute difference between the percent of minority students in the receiving school when combined with the sending school and the percent of minority students in the District minus the absolute difference between the percent of minority students in the receiving school and the percent of minority students in the district.

(Age_D - Age_S) is the average age of school plants within the district minus the age of the school plant of the sending school.

(25 # of facilities $lacking_S$) is 25 percent times the number of auxiliary facilities that the sending school lacks.

(Δ CD) is the distance between the sending school and receiving school.

(# pupils) is the projected average enrollment over the next 5 years of the sending school.

The constants represent the weights assigned to each factor. These weights were derived as follows.

Each individual board member was asked to arrange the factors in what he or she thought to be the order of importance. The most important received a weight of 10, second of 9, and so forth. The factor which received the highest overall weight was considered to be most important and received a weight of 10, etc.

The weights were then adjusted for the divergence of opinion on each individual factor. A "S" statistic (measure of divergence from the mean) was computed for each factor. This factor was then summed downward continuously for factors ranking 10 to 5 and upward continuously for factors ranking 1 to 5. The weight for each rank was then computed as follows:

For ranks 10-5:

$$W_i = 10 - 4\sum_{j=1}^{i} (S_i/281.19)$$

For ranks 1-5:

$$W_i = 5 \sum_{j=1}^{i} (S_i/290.55)$$

where,

W_i = weight of factor i

S_i = cumulative sum for factor i

Table 3 depicts each factor's composite weight, S statistic, cumulative sum, and computed weight.

TABLE 3

FACTORS' COMPUTED WEIGHTS

Composite Rank	Factor	S	$\sum S_i$	Weight
10	Achievement Levels	64.00	64.00	9.862
9	Cost Per Pupil	14.89	78.89	9.597
8	Space Per Pupil	71.61	150.50	8.324
7	Teacher Load	79.21	229.71	6.915
6	Racial Balance	51.48	281.19	6.000
5	Age and General Condition of Building	104.24	290.55	5.000
4	Auxiliary Facilities	64.04	186.31	3.206
3	Commuting Distance	41.61	122.27	2.104
2	Number of Pupils	72.42	80.66	1.388
1	Fuel Requirements	8.24	8.24	0.142

KANSAS CITY SCHOOL DISTRICT ELEMENTARY SCHOOLS RANKED
BY EFFECTIVENESS OF SCHOOL FACILITIES

Rank	School	Total Expenditures[a/]	Current Regular Enrollment[b/]	Projected Regular Enrollment[b,c/]	Special Education Enrollment	Cost Per Pupil[d/]	Space Per Pupil[d/]	Percent Combined Classrooms[e/]	Teacher/ Pupil	Achievement Index[f/]	Age of Building (Yrs)	Achievement Differential[g/]	Composite Racial Balance[h/]	Miles to Nearest School	Auxiliary Facilities			
															Food	Health	Library	Auditorium
1	Weeks	$499,986.94	874	761	52	$476.13	74.9	9.52	19.7	91.75	5	- 0.68	+ 1.01	0.24	X	X	X	X
2	Franklin, C.A.	440,060.76	776	653	44	477.60	88.3	--	30.0	87.21	6	- 7.24	+ 0.84	0.14	X	X	X	X
3	Melcher	238,251.52	627	639	0	395.11	65.6	10.53	30.3	107.33	13	+16.57	- 1.39	0.17	X	X		X
4	Richardson	309,055.26	579	521	0	431.64	81.1	5.26	29.8	98.15	10	+10.94	+ 0.19	0.14	X	X	X	X
5	Askew	282,866.52	570	624	25	395.61	88.9	16.67	30.7	111.62	51	+ 9.85	- 2.74	0.33	X	X	X	X
6	Whittier	304,990.53	767	562	17	387.04	76.3	4.35	31.6	104.86	15	+ 0.33	+ 1.09	0.28	X	X	X	X
7	Knotts	249,459.62	671	674	0	346.95	76.3	--	30.3	105.39	50	+15.82	+ 2.11	0.26	X	X		X
8	Korte-North Rock Creek	502,597.86	820	706	119	425.20	64.9	--	30.5	126.94	21/50	+ 4.04	+ 0.63	0.33	X	X	X	X
9	Sugar Creek	103,354.50	251	255	0	402.15	98.0	--	30.6	127.19	18	+17.76	+ 1.07	0.36	X	X	X	X
10	Troost	228,898.29	607	762	14	437.66	72.8	16.67	31.3	81.82	52	+19.61	- 5.45	0.28	X	X	X	X
11	Woodland	256,707.84	624	611	24	420.63	117.2	4.76	29.9	93.94	52	- 9.77	+27.96	0.19	X	X		X
12	Rumpf	333,747.92	736	634	0	378.39	69.6	--	31.6	96.19	56	+ 2.44	--	0.28	X	X		X
13	Chick	216,007.08	370	490	0	422.71	112.4	10.00	32.4	95.12	43	+ 7.91	- 3.58	0.33	X	X	X	X
14	Pershing	281,702.47	752	619	0	356.58	52.7	--	32.7	86.87	50	+ 5.05	+ 6.75	0.28	X	X	X	X
15	Linwood	242,934.68	400	314	0	607.60	129.8	7.69	29.4	92.60	19	+ 5.39	+ 0.32	0.14	X	X		X
16	Nichols	193,683.93	466	413	0	396.89	108.3	7.69	29.6	140.66	48	+ 8.50	- 2.18	0.33	X	X	X	X
17	Pinkerton	188,933.32	474	512	29	380.14	87.5	26.67	29.9	99.41	44	+14.39	+ 0.88	0.33	X	X		X
18	Ladd	406,608.39	763	599	0	395.51	102.3	9.09	30.4	99.41	82	+ 1.26	--	0.19	X	X		X
19	Garfield	244,491.96	515	581	0	403.45	76.7	25.00	30.6	103.62	12	+ 9.68	-32.34	0.19	X	X		X
20	Scarritt	251,596.75	507	478	33	400.63	100.4	12.50	31.0	104.55	48	+ 0.93	+10.12	0.24	X	X		X
21	Graceland	236,453.52	571	555	0	350.30	70.6	--	30.9	87.21	49	-10.94	+ 0.72	0.19	X	X		X
22	Meservey	326,025.73	637	615	10	412.16	82.0	15.79	30.2	92.43	46	+ 0.68	- 0.70	0.24	X	X	X	X
23	Paxon	272,092.03	505	473	9	446.74	98.6	--	29.3	94.45	63	+ 7.24	- 0.52	0.14	X	X		X
24	Willard	312,235.68	766	669	20	376.83	56.6	--	30.0	98.15	50	+10.94	- 0.95	0.19	X	X	X	X
25	Ashland	292,615.69	522	485	14	410.12	106.5	11.76	30.6	101.77	61	+14.90	-13.46	0.28	X	X		X
26	Border Star	300,365.83	552	425	77	441.06	87.5	--	30.8	137.04	49	- 3.62	+ 5.30	0.33	X	X		X
27	Seven Oaks	200,022.00	479	460	0	361.70	87.3	6.67	30.4	92.78	47	-14.57	+ 1.07	0.17	X	X	X	X
28	Three Trails	188,735.91	304	257	0	507.35	110.8	22.22	29.8	138.47	21	+11.53	- 0.35	0.47	X	X		X
29	Twain	239,263.99	611	665	10	342.29	60.1	17.65	31.2	85.02	59	-14.39	- 1.06	0.33	X	X	X	X
30	Greenwood	279,690.53	532	417	0	394.48	101.8	--	28.6	86.87	68	- 4.63	- 0.39	0.21	X	X	X	X
31	Switzer	222,242.22	595	450	0	321.62	77.8	8.70	28.1	91.75	60	-11.62	- 5.28	0.31	X	X	X	X
32	Kensington	283,643.91	441	381	109	439.07	89.3	9.09	29.9	115.32	59	+10.10	+ 2.94	0.19	X	X	X	X
33	Moore	165,772.68	381	296	8	390.97	106.8	--	31.7	96.64	59	+ 9.77	- 0.87	0.28	X	X		X
34	Marlborough	167,108.76	270	329	57	482.97	123.4	11.11	30.0	103.71	47	+16.14	- 9.48	0.33	X	X	X	X
35	McCoy	221,194.39	424	403	0	384.01	98.9	14.29	29.1	105.22	59	-10.10	- 2.38	0.19	X	X	X	X
36	Rock Creek, West	111,207.26	238	227	0	437.82	115.4	83.33	30.1	116.50	18	+28.1.	- 2.68	0.38	X	X		X
37	Blenheim	240,718.34	526	462	59	429.85	105.2	7.14	31.2	89.57	50	-15.82	- 1.86	0.26	X	X		X
38	Holmes	316,132.19	733	565	0	443.38	80.5	4.17	29.3	96.97	71	+ 4.01	--	0.28	X	X		X
39	Gladstone	166,565.51	319	228	0	397.53	115.7	12.50	29.1	111.62	59	+ 7.07	+ 0.39	0.28	X	X	X	X
40	Bryant	239,910.93	461	423	95	605.94	74.8	7.69	31.4	136.70	59	- 0.34	+ 1.07	0.26	X	X	X	X
41	Logan	200,206.01	365	363	0	475.56	106.3	27.27	30.0	96.05	19	+ 1.60	-34.06	0.24	X	X		X
42	Fairview	165,648.29	241	215	0	498.94	116.1	25.00	30.1	120.37	17	+ 2.19	- 0.62	0.19	X	X	X	X
43	Mann	311,789.30	565	429	0	369.41	95.9	22.22	28.2	91.75	70	- 2.70	+ 0.61	0.14	X	X		X
44	Fairmount	168,329.10	371	321	0	414.60	117.9	30.00	31.8	109.63	49	+ 3.28	+ 5.81	0.24	X	X		X

Rank	School	Total Expenditures[a]	Current Regular Enrollment[b]	Projected Regular Enrollment[b,c]	Special Education Enrollment	Cost Per Pupil[a]	Space Per Pupil[d]	Percent Combined Classrooms[e]	Teacher/ Pupil	Achievement Index[f]	Age of Building (Yrs)	Achievement Differential[g]	Composite Racial Balance[h]	Miles to Nearest School	Auxiliary Facilities			
															Food	Health	Library	Auditorium
45	Bancroft	$301,519.03	794	637	11	$352.26	66.1	12.00	30.7	92.76	70	- 1.43	-28.87	0.33	X	X		X
46	Fitcher	239,563.13	459	410	0	605.35	73.1	21.43	31.3	118.18	49	+ 2.19	+ 1.15	0.19	X	X		X
47	Jones	285,296.85	584	496	0	515.91	81.2	6.25	28.3	117.09	63	+ 5.47	- 5.30	0.28	X	X	X	X
48	Douglass	140,653.55	261	231	0	536.84	133.7	33.33	28.5	103.37	20	+11.62	+ 2.80	0.31	X	X		X
49	Manchester	156,133.37	295	297	0	414.14	134.2	--	27.7	98.24	56	- 6.99	+ 2.42	0.24	X		X	X
50	Hartman	212,900.14	338	284	0	560.35	145.2	9.09	30.3	91.75	58	- 2.19	+ 0.05	0.21	X	X	X	X
51	Yates	297,150.96	380	333	19	462.85	136.3	7.[illegible]	30.3	132.16	51	- 8.50	+ 1.76	0.33	X	X	X	X
52	Cook	227,639.58	307	246	58	457.62	105.2	11.[illegible]	30.8	131.73	16	+25.58	+ 9.66	0.33	X	X		X
53	Carlisle	126,249.87	190	228	0	483.71	144.5	75.00	29.7	91.50	20	-18.69	+ 0.06	0.09	X	X		X
54	Wheatley	249,226.49	423	353	19	512.81	153.2	7.69	29.0	90.58	48	- 5.47	-16.09	0.26	X	X	X	X
55	Longfellow	209,089.42	352	283	0	382.08	163.8	--	28.7	90.58	68	- 8.83	+ 1.70	0.26	X	X		X
56	Bristol	280,747.23	371	450	0	613.47	86.2	25.53	30.1	122.90	68	-32.07	- 7.82	0.16	X	X	X	X
57	Nelson	135,966.86	321	275	0	369.65	117.7	25.00	28.6	104.63	50	-48.77	-48.77	0.47	X	X	X	X
58	Harrison	183,274.31	390	336	53	376.33	112.6	20.00	29.3	104.55	60	- 5.06	-10.41	0.21	X	X	X	X
59	Walker	119,637.23	270	222	0	368.11	120.0	22.22	28.2	113.89	61	+ 6.68	+ 3.82	0.31	X	X		X
60	Thacher	211,412.66	432	437	0	392.95	70.8	7.69	28.8	102.78	76	-14.31	+ 0.18	0.19	X	X		X
61	Phillips	189,904.89	353	336	0	496.81	142.8	18.18	31.2	90.58	42	-19.81	-11.56	0.19	X	X		X
62	Garrison	148,666.27	263	229	0	428.84	115.0	11.11	28.7	103.71	84	+ 9.77	+13.97	0.28	X	X	X	X
63	Clay	172,840.60	295	227	31	498.09	143.6	22.22	32.4	112.21	68	+13.97	+ 3.58	0.26	X	X		X
64	Attucks	221,716.68	265	221	82	478.84	142.1	33.33	29.6	111.95	69	+21.37	- 0.29	0.26	X	X	X	
65	D. T. Washington	189,847.45	303	242	6	466.45	142.8	33.33	30.0	110.19	86	+18.69	- 0.06	0.09	X	X		X
66	Mt. Washington	183,773.59	367	294	0	913.32	135.9	25.00	29.5	104.15	71	- 3.78	- 5.56	0.24	X	X		X
67	Collins	119,626.99	185	155	16	484.31	149.6	20.00	31.0	108.00	70	+ 3.45	+10.73	0.21	X	X		X
68	Kuhl	133,369.56	207	158	0	501.31	144.0	33.33	32.0	116.38	67	+15.58	- 5.85	0.40	X	X	X	X
69	Martin	70,763.63	118	87	27	397.56	186.1	66.67	26.3	89.04	19	-14.56	+ 3.63	0.33	X	X	X	X
70	Delaney	188,192.77	194	179	50	609.03	183.8	33.33	26.2	126.94	59	+22.39	+ 6.63	0.24	X	X	X	X
71	Kermes	295,171.54	258	219	97	689.83	216.2	37.50	28.6	53.71	59	- 8.00	+ 6.41	0.19	X	X	X	X
72	Stark	79,983.02	103	92	0	550.60	204.6	66.67	27.0	88.39	44	-28.11	+ 0.89	0.38	X	X		X
73	Berwick[i]	138,230.25	169	193	16	845.93	201.7	66.67	29.2	107.41	68	- 6.68	+ 7.56	0.21	X	X		X
74	Allen	139,551.77	74	55	79	774.87	208.8	100.00	25.2	104.55	82	- 3.45	+10.88	0.21	X	X		X
75	Pleasant Valley		13		0		662.0	100.00	6.5		14							X

NOTES TO TABLE

a/ Includes all costs which are assigned directly to school site with the exception of cafeteria costs: Principals, teachers, teachers aides, utilities, librarians, teaching supplies, office supplies, health supplies, contracted maintenance, replacement--furnishing and equipment, capital outlay, clerical, custodians, library books, textbooks, contracted services, custodial supplies. Based on 1971-72 figures supplied by the School District.

b/ Total enrollment grades K-7, excluding special education students.

c/ Average annual enrollment over next 5 years.

d/ Expressed in square feet. Based on current enrollment, including special education pupils.

e/ Regular classrooms containing two or more grade levels in relation to total classrooms. Classrooms containing special education pupils were omitted for purposes of this analysis, as these students are not grouped by grade.

f/ This index was derived from the Iowa Basic Skill Test scores as listed in the Report of Measured Achievement and Scholastic Aptitude, 1972-1973. An overall score for each the third and sixth graders within the total district was computed as being the norm or median of the individual item test scores as given for the system. A norm was then computed from the individual item test scores for the third and sixth graders within each school. Two ratios were then developed for each school: the norm for the third graders within that school to the norm for the third graders throughout the district and the norm for the sixth graders within that school to the norm for the sixth graders throughout the district. The index was computed as the average of these two ratios.

g/ The difference in achievement index between the sending school and receiving school. Negative values indicate the sending school has a lower achievement index than the receiving school. Positive values indicate the sending school has a higher achievement index than the receiving school.

h/ The effect on the racial balance of the receiving school. Positive values indicate that the transfer of students would cause the racial balance to move away from the overall district balance. Negative values indicate that the transfer of students would cause the racial balance to more toward the overall district balance.

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